National Aeronautics and Space Administration, Ames Research Center, Moffett Field, CA

The Ames Astrogram

Communication for the Information Technology Age

June 2002

O'Keefe features new message, approach, style

-- Administrator emphasizes 'One NASA' and 'Freedom to Manage'

There are fundamental changes underway at NASA. It is definitely not 'business as usual' at the nation's space agency -- be it in substance, process, focus or image.

Nowhere was that more evident than in the second 'NASA Update' for agency employees on May 21 carried live on NASA TV. Dressed smartly, but less formally than his predecessor, Administrator Sean O'Keefe began by declaring his intention to spend a little time "chatting" with "members of the NASA family," and discussing President Bush's Freedom to Manage initiative. And he did so – in a relaxed, conversational style on a 'set' more reminiscent of late night network TV news analysis programs than the traditional NASA stage, table and podium setup.

O'Keefe stressed that his primary focus is "looking specifically at how we emphasize agency objectives and 'one NASA' kinds of objectives." He said that it is important for NASA to undertake "collaborative efforts" – to be "specific about our focus" across enterprises, across centers, and across boundaries. This approach, while a departure from the past, "takes away nothing from the rich history of every center," and the 44-year legacy of the agency, O'Keefe maintained.

Calling NASA a "storied institution," O'Keefe said we must identify "what we bring to bear that uniquely identifies our contribution" and that which, "if we didn't do it, it might not get done at all." Working together with the enterprise associate administrators and NASA center directors, O'Keefe said that his senior management team has identified three NASA primary mission objectives: protection of the home planet, exploration of the universe, and inspiration of the next generation of explorers.

These objectives are "not specific to any one center, any one aspect of headquarters, or any one enterprise," O'Keefe stated. "Our rich diversity of backgrounds is one of our greatest assets. We must work in collaborative and cooperative" ways, "not unique to any one center or any one enterprise."

O'Keefe paid particular attention to NASA's responsibility to engage young people in the pursuit of technical careers. He noted that "people, especially kids, identify with us;" they find us "exciting beyond measure." Still, he observed, the number of students pursuing careers in math, science and engineering has continued to decline over the past decade, even as opportunities in these fields are growing. At NASA, "how can we use what we do everyday to inspire the next generation?" O'Keefe wondered aloud, particularly since "the requirement for doing so was never more present than now."

Turning to his main theme, O'Keefe asked "how do we accomplish our mission objectives as part of our primary everyday focus, not after all the other things are done?" How do we prevent ourselves from becoming distracted by the bewildering range of impediments we face daily? he asked. The answer is found in the 'Freedom to Manage' (F2M) initiative that NASA is now eagerly exploring, he said.

"The President has given us the opportunity to challenge and contest the way we do business," O'Keefe pointed out. We must ask ourselves why we do business at NASA the way we currently do. Is it the law, is it habit, are the obstacles self-inflicted, or are they perhaps imagined – is there even a rule or restriction in play at all?

We face statutory limitations, O'Keefe noted, and there may "not always be a better way." But, "due to the President's leadership," there is an "opportunity," a "receptivity to challenge, rethink and contest" the way we operate. We must ask ourselves, "what is the purpose, outcome, objective and how do we accomplish it best?" We must "know no bounds," by enterprise or center.

O'Keefe declared that "we have put in motion at NASA a process for looking at this," for "breaking down boundaries" through the F2M initiative. It is "already starting to yield some results," he added, although not necessarily of the "Earth-shaking" variety. As examples, he cited the streamlining of NASA 'time and attendance' practices, the standardization of all NASA badges and entry procedures, and efforts to address hiring impediments and delegate authority as close as possible to the entity responsible for actual program performance.

O'Keefe promised NASA will operate in

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Abundant water ice found on Mars

A dramatic announcement by NASA scientists on May 28 -- that instruments on the 2001 Mars Odyssey spacecraft have found enormous quantities of water ice just beneath the surface of Mars -- has once again raised the possibility of a human mission to Mars. The discovery of enough water ice to fill Lake Michigan twice was widely reported by news media around the world.

"This is really amazing. This is the best direct evidence we have of subsurface water ice on Mars," said William Boynton, principal investigator for Odyssey's gamma ray spectrometer at the University of Arizona, Tucson. "We were hopeful that we could find evidence of ice, but what we have found is much more ice than we ever expected."

Scott Hubbard, deputy director for research at Ames and former head of NASA's Mars program, shared the scientists' excitement. "I am just ecstatic," he said. "A great effort went into making Odyssey successful in the aftermath of the Mars mission failures. We are now reaping the great scientific rewards of this effort."

Scientists used Odyssey's gamma ray spectrometer to detect hydrogen, indicating the presence of water ice, in the upper three feet of soil in a large region around the planet's south pole. "It may be better to characterize this layer as dirty ice rather than as dirt containing ice," added Boynton. The detection of hydrogen is based both on the intensity of gamma rays emitted by hydrogen, and by the intensity of neutrons that are affected by hydrogen. The spacecraft's high-energy neutron detector and the neutron spectrometer observed the neutron intensity.

The amount of hydrogen detected indicates 20 percent to 50 percent ice by mass in the lower layer. Because rock has a greater density than ice, this amount is more than 50 percent water ice by volume. This means that heating a bucket of this ice-rich soil, would result in more than half a bucket of water.

While news media throughout the world are reporting that NASA now plans to send a human mission to Mars, "The agency has set no timetable for the human exploration of Mars," said Hubbard. "But the ability to 'live off the land' by use of existing resources like water would make the planning for such a journey much more feasible. Ice can be used to make oxygen to breathe, water to drink and rocket fuel for travel," he added.

The other key question resulting from this discovery is whether it increases the likelihood that life at some level exists, or once existed, on the red planet. "The theme of the restructured Mars program is 'Follow the Water'," Hubbard said. "Liquid water is a key to life. What is being detected is strong evidence for water ice. We do not know of

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Botball tournament showcases student initiative

Education has taken a front seat at NASA with Administrator Sean O'Keefe's recent declaration that education is a core component of the agency's mission. The agency is to engage students and inspire the next generation of explorers. One successful means of doing this is through robotics.

On May 11, hundreds of local middle and high school students from 30 teams competed in the Silicon Valley Botball 2002 tournament held at the Moffett Training and Conference Center.

photos by Jonas Dino

Students competing in the recent Botball 2002 tournament at NASA Ames.

Unlike most robotics competitions, BotBall robots are autonomous. All instructions are programmed into the robots, using a form of C computer language, prior to the start of each match. Anticipating an opponent's moves while completing their tasks is a testament to the planning and engineering skills of these competitors.

"Future engineers get a kick out of building things. This program challenges them to build both software and hardware and create an autonomous mobile robot," said Terry Grant, NASA engineer and Botball mentor.

For this year's competition, opposing robots placed colored ping-pong balls into various scoring areas in the 4 foot-by 8-foot arena. Scoring ranged from one point for balls released from 'nests' to seven points for balls placed in a basket placed about 15 inches above the playing field. For 'extreme' points, robots battled for one large foam ball worth up to 30 points. Each round lasted 90 seconds, at which time each robot automatically shut off or received no points.

Every year, Botball students, who range from 13 to 18 years old, receive identical kits to build their robots. Each kit contains hundreds of parts, including sensors, motors, battery-powered microcomputer/controllers and programming software. The students work on a strict deadline to design, build and test their robots.

"The students learn how to work under pressure as a team because they are given only six weeks to prepare for the contest." Grant said. "Botball also challenges students to learn and use Internet research skills for the research-design project portion of the tournament."

Volunteer mentors from NASA, industry and educational institutions were involved during the design and testing phases to provide technical support when needed. An army of NASA volunteers also gave up their Saturday to ensure the tournament ran smoothly.

Botball tournaments have gained popularity nationwide, with hundreds of teams in 11 regionals: Silicon Valley, Southern California, Texas, Oklahoma, Georgia, Washington D. C., Florida, Michigan, Pennsylvania, Indiana and Massachusetts. National championships will be held June 29 - July 2 in Norman, Okla.

The Botball concept was developed by the non-profit KISS Institute for Practical Robotics (KIPR) based in Norman, OK. KIPR is a community-based organization that provides improved learning and skills development through applied technology. The Robotics Education Project spearheads robotics education for NASA and supports other student robotic programs such as FIRST Robotics and FIRST Lego league.

Tournament results can be found on the internet at: http://www.botball.org/php/standard/region.html?reg_id=9 Information about the NASA Robotics Education Project can be found at: http://robotics.nasa.gov

BY JONAS DINO

B-17, B-24 thunder over Moffett

Two fully restored World War II vintage bombers, a B-17 Flying Fortress and a B-24 Liberator, were on display and available for rides May 31 through June 3 at the nationwide 'Wings of Freedom Tour' at Moffett Field. The event was sponsored by the Collings Foundation to support 'living history' events that teach Americans about their heritage.

IEEE sponsors power supply presentation and Ames tour

The Santa Clara Valley Chapter of the IEEE Power Engineering Society sponsored a presentation and luncheon at Ames on May 22 followed by a tour of Ames' Arc Jet Facility. The presentation offered insight into the design choices for the modernization of the obsolete thyristor stacks and controls for the 60 MW DC power supply. Project manager Francis Choy of Code FEF gave an overview of the project and the arc heaters, while project engineer Boris Ilinets of Jacobs Sverdrup spoke about the facility design itself. Stig Nilsson of Exponent Failure Analysis discussed the new design technology at the component level, while Joe Hartman, Code ASF branch chief, Ernie Fretter, Arc Jet Facility manager and Ryan Cooper, lead Arc Jet electrician, provided tours. More than 50 engineers from Silicon Valley were in attendance. The event was organized by the DMJMH&N Electric Power Office.

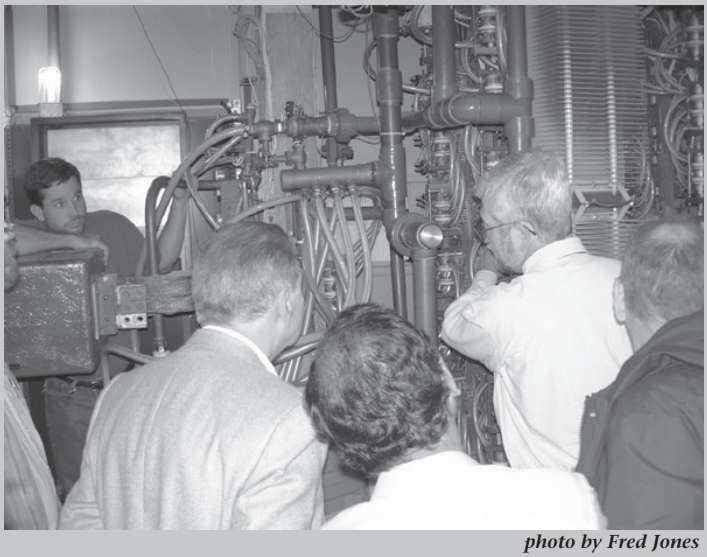

photo by Fred Jones

Boris Ilinets reviews the existing rectifier design at the Ames Arc Jet Facility.

The NASA Ames 60 megawatt DC power supply was built in 1974 to provide controlled DC power for the Thermophysics Facility Arc Jet Laboratory. The Arc Jet Laboratory uses a sustained high-voltage electric arc to develop very high temperatures in order to test the thermal performance of various materials. Ames is historically strong in space technology development. The Thermal Protection Systems and Arc Jet Testing Laboratory enable hypervelocity flight in the atmospheres of the Earth and other planets and were essential for the Apollo, shuttle and Galileo Probe vehicles. Advances in thermal protection will also support the exploration of Mars, the outer planets, and sample return missions. They are being further applied to studies of reusable launch vehicles in the NASA technology development partnership with industry. Ames is working with other NASA centers on aerobraking and advanced regenerative life support technology to permit human Mars exploration without the need for new, larger launch vehicles.

The power supply has gradually lost reliability due to outdated technology and component life limitation. NASA has decided to upgrade the existing rectifier modules with contemporary high-power electronics and control equipment. The power supply includes three, three-winding rectifier transformers. The power control system was replaced in December 1999 and consists of a combination of LabView TM based control protocol and hard-wired relay logic. The firing angle control system is controlled by the firing angle regulation. The present firing angle control system is obsolete.

This project includes a complete replacement of obsolete thyristor stacks in all six rectifier modules, and rectifier bridge firing and control systems. High-power, water-cooled thyristors and freewheeling diodes will be used. The output current rating of each of the six modules will be 4000 amps at 5500 volts. The firing angle control signal will be sent from the facility control system to the six modules through fiberoptic cable. The power supply control and monitoring system will include a master programmable logic controller (PLC) in the facility building and a slave PLC in each rectifier module. This system also will monitor each thyristor and freewheeling diode in each stack and the auxiliary equipment.

BY FRED JONES

Code JFP wins EPA award

Recently, the NASA Ames Plant Engineering Branch (Code JFP) was awarded the 2002 Environmental Achievement Award from the U.S. Environmental Protection Agency's Region 9 office in recognition of exceptional work and commitment to the environment.

As a result of improved management practices, Ames realized significant reductions in pesticide and fertilizer use, as well as a dramatic drop in solid wastes disposal in 2001. The Plant Engineering Branch uses an integrated approach to landscaping and grounds maintenance that consists of three components -- integrated pest management (IPM), integrated vegetation management (IVM) and composting. With its integrated grounds and landscaping management program, Ames achieved a 98 percent reduction in pesticide and herbicide use in 2001 compared to pesticide use prior to the implementation of its IPM and IVM programs. In addition, in 2001 Ames reused 100 percent of its landscaping debris, resulting in savings of approximately $60,000 -- the cost of approximately 2200 cubic yards -- by producing its own compost on site. Over one-third of the center's total solid waste volume was diverted from land disposal in 2001 due to the onsite reuse of landscaping debris.

Pest control activities at Ames historically included the use of pesticides and herbicides in outdoor areas, building perimeters and building interiors. Prior to implementation of the integrated grounds and landscaping management program, an average of 4,000 gallons of pesticides and herbicides was used at Ames each year.

Integrated pest management (IPM) employs management techniques that reduce the quantity and toxicity of pesticides used. In some cases, large-scale pesticide application has been eliminated entirely and traps are used instead. Pesticide and herbicide application has been reduced from 4,000 gallons in 1997 to less than 50 gallons using IPM and IVM techniques. Reduced use of pesticides, herbicides and chemical fertilizers has resulted in reduced exposures to human and animal populations.

Integrated vegetation management includes the utilization of less toxic herbicides, reduced use of these less-toxic herbicides and use of native vegetation that is hardier and more drought-tolerant. In addition, a unique IVM approach at Ames is the use of goats to control 'stubborn' vegetation.

The benefits of IPM and IVM are not limited to reduced environmental impacts. Reduced use of pesticides, herbicides, and chemical fertilizers has resulted in cost sav-

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Ames' La Follette named NASA 'supervisor of the year'

Carolyn S. La Follette, chief of the Acquisition Branch for Center Operations and Space, was recently honored as the NASA procurement supervisor of the year.

The award was presented to La Follette by the associate administrator for procurement, Tom Luedtke, at the NASA Procurement 2002 Conference held March 12-14 in Tysons Corner, Va.

The award specifically recognized La Follette's support of her employees with regard to training, education, promotions and diversity.

La Follette has been at Ames since 1975 and has been a supervisor for 20 years. Her branch currently supports Codes J and S, as well as the entire center for all grants and cooperative agreements.

photo by Debora McCallum, Goddard S pace Flight Center

Tom Luedtke, assistant administrator for procurement (Code H), presents the 'NASA Procurement Supervisor of the Year' award to Carolyn S. La Follette, chief, Acquisition Branch for Center Operations and Space (Code JAC). The award read as follows "Procurement Supervisor of the Year. In recognition of your contribution and outstanding support to the United States Space Program and to the Office of Procurement."

Wildlife planning at Ames

photo by Tom Trower

Chris Alderete, NASA Ames wildlife biologist, spoke at Ames on May 15 about the center's wildlife management plan. Several wildlife studies are currently being conducted to gain information used to manage sensitive species. Alderete discussed current and future management strategies and objectives in both coastal salt marsh and upland grassland habitats.

VPP STAR Tip:

Very few work sites are checking to see how well the training they provide is helping the worker to understand and work more safely.

....Margaret Richardson, in Preparing for the Voluntary Protection Programs, Copyright @ 1999 by John Wiley & Sons

Safety data for March - April 2002

	Civil Servants	Contractors
Not recordable first aid cases	6	3
Recordable no lost time cases	3	2
Restricted workday cases	0	2
Lost workday cases	0	0

Data above are as of 5/28/02. May be subject to slight adjustment due to late reporting or new information or reclassification.

PDM project module updates set

The position description management (PDM) is one of the project modules that currently is cascading into implementation under the agency-wide integrated financial management program.

PDM will automate the position description classification process through use of a Web-based program. This module is scheduled for 'roll out' this summer at Ames.

In order to introduce the new PDM module to supervisors, PDM demonstrations are scheduled during the months of June and July. Supervisors will be notified about how to sign up for a particular demonstration session.

The PDM demo sessions are scheduled as follows:

- June 18, 9:30 a.m. to 11:30 a.m. and 1:30 p.m. to 3:30 p.m.
- June 26, 9:30 a.m. to 11:30 a.m. and 1:30 p.m. to 3:30 p.m.
- July 10, 9:30 a.m. to 11:30 p.m. and 1:30 p.m. to 3:30 p.m.
- July 18, 9:30 a.m. to 11:30 a.m. and 1:30 p.m. to 3:30 p.m.

Ames' Cowings featured in new airport display

Ames psychophysiologist Dr. Patricia Cowings is featured in a new museum exhibition honoring African-American inventors at San Francisco International Airport.

The San Francisco Airport museum is featuring Cowings in an exhibit entitled 'California Inventors' through August. The photography exhibit features 12 African-Americans who have made contributions to science, medicine and technology in California. It will be on display in the airport's Terminal 1 Gate 36 exhibit gallery.

"I'm very flattered when I'm asked to participate in things like this. There just aren't enough African-American women in science and technology," said Cowings, director of the Psychophysiology Research Facility at Ames. "It is important to let people know that NASA's here and what we are doing."

The exhibit highlights Cowings' development of a system to combat space adaptation syndrome and its earthly counterpart, motion sickness. The patented technology, called the 'autogenic-feedback training exercise,' enables pilots, astronauts and patients with balance disorders to learn to control symptoms of nausea and dizziness.

When using the system, an astronaut wears a bodysuit garment designed by Cowings. The suit measures body temperature, blood pressure, heart rate, respiration and sweating, and then gives the wearer a read-out of his or her physiological state. Cowings also created training software that can be used over the Internet.

Cowings has trained space shuttle astronauts, Russian space station Mir cosmonauts, search-and-rescue pilots, and military personnel. "We are looking at what the environment is doing and whether the treatment is working. Does the sickness affect your performance? Once the symptoms are relieved, does your performance improve?" Cowings asked.

The airport exhibit also showcases seven other inventors whose innovations have contributed significantly to the space program, including: Christine Darden, aerospace engineer at NASA Langley Research Center, Hampton, Va.; George Carruthers, a research physicist at the Naval Research Laboratory, inventor of a camera used on the Apollo 16 moon mission; Ayanna Howard, an artificial intelligence expert at NASA's Jet Propulsion Laboratory, Pasadena, Calif.; Irene Long, chief medical officer of Spaceport Services at NASA Kennedy Space Center, Fla.; Vance Marchbanks Jr., an Air Force colonel who helped design the Apollo moon mission space suit; and retired astronauts Dr. Mae Jemison and Guion Bluford Jr.

"This is a way of letting people know about the wealth of creativity and innovations in other communities. Our audience may not be aware of the role African-Americans have played in aeronautics, chemistry or whatever," said Timothy Taylor, curator of the San Francisco Airport museums. "But we wanted their stories, talents and creativity to carry the day and not their race." More information is available at: http://www.sfoarts.org/

Cowings earned her doctorate in psychology from the University of California, Davis, in 1973 and came to NASA Ames as a National Research Council post-doctoral associate. She has won the Ames Honor Award for Excellence, the Candace Award for Science and Technology, and the Ames Honor Award for Technology Development.

"I was one of three women in my department at Davis and the only brown person," Cowings said. "I was also known as the 'space cadet' because I would encourage everyone to watch all the space launches. When I got to Ames I knew I was home, I had gotten here. The people here were doing exciting research, not just thinking or talking about it."

Cowings cited other African-American women who were pioneers in their field as her inspiration, including Jemison, the first black woman in space, and Nichelle Nichols, the actress who played Lt. Uhura on TV's 'Star Trek' series. "I was planning on being Lt. Uhura -- I even had the earrings! She was a breakthrough personality of her time. I couldn't relate to Spock with his pointy ears, but I could relate to her," Cowings said.

BY KENDALL POWELL

Former Ames employee Adrian Mandel passes on

Dr. Adrian Mandel, a former Ames employee, succumbed to cancer on April 3, 2002. Mandel, an immunologist, was employed at Ames from 1966 until 1990, following his first career in the Army. Throughout his research career, he made major contributions to microbiological contamination control, serving as a member of the Interagency Committee of Back Contamination, developing the barrier system for the study of returned lunar material, studying long-term isolation effects on the immune system at McMurdo Base, Antartica, developing an immunology program for prodromal diagnosis of infectious diseases, and consulting on microbial control in the Spacelab program.

He is survived by his wife, Claire, of Los Altos Hills, Calif.; his sons Robert Mandel of Denver, and St. Petersburg, Fla; Michael Mandel of Seattle; John Mandel of Watsonville, Calif.; his daughters Jane Weinstein of Haifa, Israel; Elizabeth Mandel of New York City; and Susan Mandel of Palo Alto, Calif.; five grandchildren and one great grandchild. His intellect, dry sense of humor and wonderful sense of worth will be missed by his many colleagues at Ames.

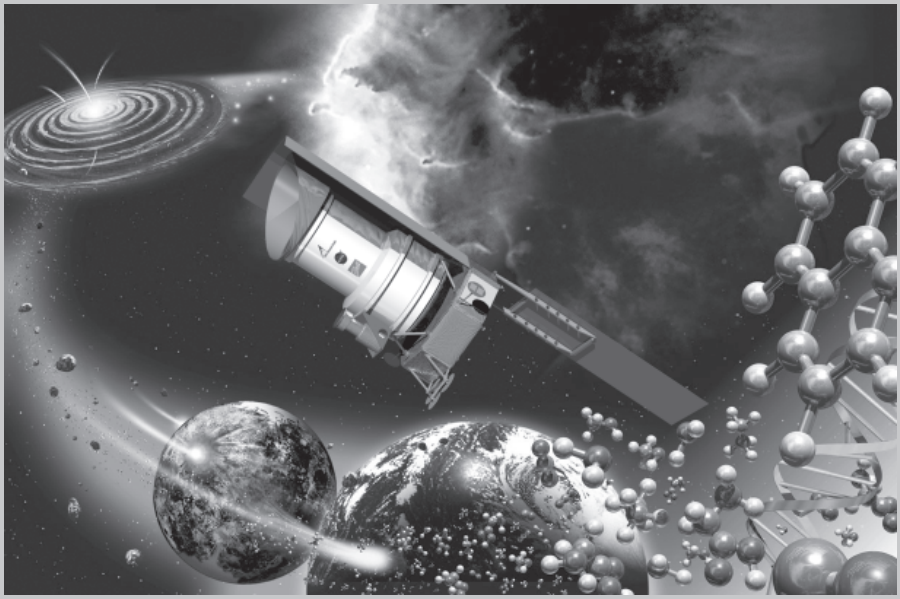
photo by Roger Brimmer

Dr. Adrian Mandel (left) is shown here speaking with Ames' 'Hall of Fame' member Harv Lomax.

AstroBiology Explorer selected for concept study

On April 17, the AstroBiology Explorer mission team at Ames learned that their first-time proposal submission had been selected by the NASA Explorer Program for a 'phase A' feasibility study. Such selection is a rare event in the Explorer program.

Dr. Scott Sandford of the Ames astrochemistry laboratory (in Code SSA) is principal Investigator; Sylvia Cox of the Space Projects Division (Code SF) is managing the effort. The AstroBiology Explorer, known as ABE, is a proposed space telescope that will look at five different classes of celestial objects using infrared spectrometers tuned to wavelengths that can detect the signatures of organic compounds –- the pre-biotic chemical building blocks that are important for life.



The Astrobiology Explorer will use a cooled infrared telescope to detect and identify organic molecules throughout the universe. (This artist's rendition was designed by Andy Christie of Slick Films, Inc. The spacecraft image was designed by Dr. Jason Dworkin, the SETI Institute. The image was published in Scientific American, July 1999).

ABE will receive $450,000 in funding to assist with development of the mission concept as a candidate under NASA's Medium-class Explorer program -- a roster of low-cost, focused next-generation spacecraft in the $180 million or less range. The ABE concept uses highly sensitive instruments fitted to a solid hydrogen-chilled telescope.

If selected as a fully funded mission, the spacecraft could fly as early as 2007. The ABE spacecraft will be put into an orbit around the sun, gradually drifting 14 million miles away from Earth during its 18-month mission lifetime. Mission plans incorporate both 'guest observer' and robust education and public outreach programs.

"This is a critical step along the road toward becoming a real mission; we are now getting down to designing the nuts and bolts of the project," said Sandford. "We will be looking for the infrared signatures of organic materials in space, and we need an infrared telescope in space to do this. We couldn't measure the signals we are searching for using even the largest ground-based telescopes because the Earth's atmosphere glows in the infrared, and absorbs radiation from space at many infrared wavelengths."

During the four-month, phase A feasibility study period, the team will expand on details of the mission design, explore additional ways to improve cost, risk and efficiency factors of the mission and select a mission management partner. The Ames team is working with Ball Aerospace and Technologies Corp., which will build the instrument and spacecraft. The ABE team will generate a concept study report for NASA review in October. ABE is one of four missions selected for study. In March 2003, NASA will choose two of the four missions to be fully developed for flight as medium-class Explorer or MIDEX missions to be launched in 2007 and 2008.

The telescope and its instruments will measure light in the infrared portion of the spectrum at wavelengths about 10 times longer than what the human eye can see and that we experience as heat. These wavelengths are ideal for searching for organics in space since they span the range of frequencies associated with molecular vibrations. Most organic molecules produce characteristic spectral 'fingerprints' in the infrared.

"The ABE telescope must be chilled and put into space in order to detect the very weak signals it seeks, which would otherwise be lost in the flood of infrared radiation produced by the Earth's own warmth," said Sandford. "It's as if we were trying to detect the light from a candle that is held in front of a searchlight. Chilling the telescope and putting it in space is like turning off the searchlight."

ABE will search for organic molecular compounds in galaxies, the interstellar medium, dense clouds, dying stars, asteroids and comets. ABE's primary goal is to understand the molecular chemistry in space and to identify the molecules that are found in a range of space environments. ABE observations will provide new insights into the physical nature of the young stars, comets, galaxies and other objects in the universe.

ABE's science team comprises world experts in astrochemistry and space astronomy. These researchers, from scientific institutions around the world, will look for the spectral signatures of complex organic molecules and the simpler molecules from which they are formed, such as water, ammonia and methanol. In recent laboratory simulations of cold, space-like conditions, Sandford and other Ames astrochemists found that organic molecules, including those necessary for life, may be produced in deep interstellar space.

One advantage ABE will have over previous infrared space observatories is its large, sensitive infrared light detectors. These devices, developed jointly by the Ames Sensors and Instrumentation Branch (Code SFD) and Raytheon Infrared Operations, will allow ABE to collect millions of pixels of information at once, a vast improvement over previous infrared space missions.

"ABE will have three instruments called spectrometers, which will slice up the light collected by the telescope," said Ames' Dr. Tom Greene, the ABE mission architect. "The detectors in these spectrometers will sense the unique infrared signatures of many atoms, molecules and dust grains."

Ames leads NASA research in astrobiology, the study of the origin, evolution, distribution and destiny of life in the universe.

The Explorer program is managed by NASA's Goddard Space Flight Center, Greenbelt, Md., for the Office of Space Science, Washington, D.C.

More information about ABE is available at: http://www.astrochem.org/abe.html More information about the Explorer program and the other selected proposals is available at: http://fpd.gsfc.nasa.gov/410/index.html

BY KATHLEEN BURTON

NASA centers, academia to cooperate in forming UAV center

On May 29, NASA officials signed an agreement to explore development of a world-class center designed to investigate science and commercial applications of unmanned aerial vehicles (UAVs) equipped with high-resolution digital imaging systems.

During a ceremony at NASA Ames, officials from Ames; NASA Dryden Flight Research Center, Edwards, Calif.; Clark University, Worcester, Mass.; and the non-profit Girvan Institute, signed a memorandum of understanding to establish a 'UAV Applications Center' in the NASA Research Park.

photo by Tom Trower

NASA Ames Research Center Director Dr. Henry McDonald (front, center), Clark University President John Bassett (front, left) and Paul Coleman, CEO/ President of the Girvan Institute (front, right), signed an agreement on May 29 to explore development of a world-class center designed to investigate science and commercial applications of unmanned aerial vehicles (UAVs) equipped with high-resolution digital imaging systems. Second row participants: Stephen Dunagan, Dave Peterson, Jim Brass, Stan Herwitz, Ken Souza (Code DK), Estelle Condon (Code S) and Carolina Blake (Code DK).

"We are delighted to be working with Clark University, the Girvan Institute and our friends from the Dryden Flight Research Center to explore prospects for developing this exciting new center here at the NASA Research Park," said Ames Center Director Dr. Henry McDonald.

The charter of the new center is to conduct collaborative research and development, leading to enhanced scientific and commercial utilization of UAVs as high-resolution imaging platforms in national airspace. Specific activities will include planning future UAV image acquisition campaigns; developing procedures for operating UAVs in Federal Aviation Administration-controlled airspace; testing and evaluating high-resolution imaging systems; testing real-time telemetry systems for payload control and data transfer; evaluating data acquisition and control systems for real-time applications; developing and packaging automated image processing streams; integrating imaging payloads onto UAVs; and implementing educational research opportunities for university students.

"We are excited by the tremendous commercial potential of UAV research and happy to be working with NASA Ames and our other partners on this project," said Clark University President John Bassett. "We are confident that the UAV Applications Center will serve as a useful model for efficient and responsible technology transfer."

The Ames-based research team is currently conducting a $3.76 million project for NASA's UAV science demonstration program. The effort will provide the first-ever test of the commercial use of a solar-powered UAV operating in national airspace. Dr. Stanley Herwitz, professor of earth science at Clark University, serves as principal investigator and leads a team of 15 researchers. The selected demonstration site will be the largest coffee plantation in the USA, located on the Hawaiian island of Kauai.

The project will use a lightweight flying wing called the Pathfinder Plus, developed for NASA Dryden Flight Research Center with partner AeroVironment Inc., Monrovia, Calif. If successful, the project holds broad implications for any users needing high-resolution imagery in near-real time. This emerging technology could be used to fight forest fires, evaluate environmental change, or assess civil emergency responses.

Visit http://www.clarku.edu/faculty/herwitz/ for details about the UAV Coffee Project.

"The agreement comes at an opportune time when NASA is working more with the Federal Aviation Administration and the Department of Defense to enable UAV operations in the commercial marketplace," said Rich Christiansen, associate director for planning at the Dryden Flight Research Center.

"This dynamic new collaboration will provide an excellent stimulus for accelerating technology development between NASA's field centers, the academic community, and the private sector," said Carolina Blake, chief of the Ames Commercial Technology Office. "This proposed center will complement NASA Administrator Sean O'Keefe's vision and goals for the agency."

Clark University is a private, coeducational research university with 2,000 undergraduate and 600 graduate students. Since its founding in 1887 as the first all-graduate school in the United States, Clark has challenged convention with innovative programs such as the International Studies Stream, the Strassler Family Center for Holocaust and Genocide Studies and the five-year BA/MA programs with the fifth year tuition-free.

Further information about Clark University is available at: http:// www.clarku.edu For information about the NASA Research Park, visit the project Web site at: http:// researchpark.arc.nasa.gov Publication-size images of the signing ceremony and UAV coffee project are available at: http:// amesnews.arc.nasa.gov/releases/2002/02images/coffee/coffee.html

BY MICHAEL MEWHINNEY

Section 508 for Web developers, Boot Camp II

Do you develop, distribute or maintain information via the Web or procure the development of Web sites at NASA? If so, that makes you a Web site curator responsible for adhering to Section 508 of the Rehabilitation Act. Section 508, which went into effect June 21, 2001, requires new federal Web sites to comply with 16 basic standards (http://www.webaim.org/standards/508/checklist) that facilitate information accessibility for people with disabilities.

Because of the importance of Section 508, the Web services group, Code JTA, has scheduled a presentation to ensure that Ames Web developers have the information needed to comply with this regulation.

Boot Camp II will be a panel presentation with the new Web services group presenting information about specific policy guidelines and the 16 standards. A focus will be on the most common mistakes made by Ames Web masters in following the 16 standards. Specific demonstrations and examples will show:

- Web image handling for Section 508 compliance;
- Differences in programming data tables and formatting tables on the Web; and
- How programming technology can be used for 508 compliance by easily developing alternative, accessible versions of a Web site

The panel also will introduce concepts such as information design and usability and discuss how these techniques relate to developing accessible Web sites. At the end of the presentation, the Web services group will be available at individual workstations for more specific questions and demonstrations. For more information, visit: http://webmasters.arc.nasa.gov/access/508/

The date of the presentation is June 27, at 10:30 a.m., in N245 auditorium. Visit http://ittrain.arc.nasa.gov for class information and/or contact Elisabeth Tu, etu@mail.arc.nasa.gov

Stunning NASA pictures added to 'AmesNews' Web site

A gallery of NASA pictures, with each image linked to news releases and other related items, recently was added to NASA Ames' public affairs Web site at: http://amesnews.arc.nasa.gov/imagearchive/archive.html

Most images are provided in preview versions, as well as in higher resolution files. Almost all of the larger files are suitable for publication. A help section describes various levels of quality, rights issues and how to download images through the Internet to a user's computer.

"We redesigned how we present images to make the site more efficient to the news media, general public and students," said the image gallery's author, Anil Jindia, of Ames' Public Affairs Office, Code DX. "These images can help readers to better comprehend our news items."

"The new image gallery is part of a comprehensive re-design of the Web site," said Jonas Diño, the site's curator, also of Ames' Public Affairs Office. "The Web site has been simplified to make sure people, including those with physical challenges, can easily access information."

General groups of images in the gallery include: popular images, aerospace, educational and commercial technology, information technology, Earth sciences, NASA/Ames/Moffett Field and astrobiology. Astrobiology is the study of the origin, evolution, distribution and future of life in the universe.

More pictures and image subject groups will be added over time. In addition, the 'amesnews' site, located at: http://amesnews.arc.nasa.gov/ provides links to other scientific and technical Web pages, educational materials and the Ames employee newspaper, the 'Astrogram.'

The Astrogram newsletter, though intended for employees, often contains newsworthy information of interest to a wider audience, including the general public and journalists. On-line issues of the Astrogram, beginning with the Jan. 1, 2000 newspaper, are in portable document format (PDF).

The Ames Education Web site includes a section describing the NASA Ames Educator Resource Center that has lesson plans, educational publications and audiovisual instructional materials.

NASA Ames news releases also are available at the time of issue by e-mail. To receive Ames releases via e-mail, send an e-mail with the word 'subscribe' in the subject line to: ames-releases-request@lists.arc.nasa.gov. To unsubscribe, send an e-mail to the same address with 'unsubscribe' in the subject line.

Additionally, NASA Ames Web pages in Spanish, 'Amesnoticias,' are available at: http://amesnews.arc.nasa.gov/index_span.html

BY JOHN BLUCK

TGIR features 'Future of Flight'

With the Centennial of Flight approaching, the fourth annual Turning Goals Into Reality (TGIR) conference focused on NASA's past, present and future involvement in aerospace. The conference took place May 21 to 23 at the Westin Hotel in Santa Clara, Calif.

Held this year in conjunction with the American Institute of Aeronautics and Astronautics (AIAA) X-Vehicles symposium, the TGIR conference is a means by which NASA's Office of Aerospace Technology (OAT) can recognize the outstanding work performed by the men and women of NASA's aerospace enterprise.

Aerospace Technology Engineering Challenge award winners Christopher Broere and Brendan Dwyer brief TGIR attendees on their design for a reusable launch platform.

Dr. Henry McDonald opened the conference by welcoming the nearly 250 attendees representing the military, industry partners and NASA personnel. Sam Venneri, current Associate Administrator for Aerospace Technology, presented an overview of how the aerospace enterprise is refining itself to meet the challenges set forth by the NASA Administrator.

The conference had presentations and panel discussions on the future of aerospace, improving the national airspace system, technological innovations in aerospace, increasing access to space, the impact of information technology and aerospace applications of nanotechnology and biotechnology.

On the last day of the conference, TGIR awards were presented and some partook in a tour of Ames 80ft by 120ft wind tunnel, VSTOL research facilities, IT research labs and FutureFlight Central. A highlight of the last day was the demonstration of a reusable launch platform by student winners of the Aerospace Technology Engineering Challenge.

For Increasing Capacity, Direct-To (D-2) was recognized. D-2 is a decision support tool that can cut flight times by making it possible for aircraft to take the most direct route to their destinations. The SIRCA TPS team received the award for Mission Affordability for this work on organo-ceramic thermal protection.

A Pioneering Technology Innovation award was given to the Advanced Design Technologies Testbed team for this rapid analysis tools in support of the Space Launch Initiative. The Commercialize Technology award was given to the Smart Surgical Probe team for adapting a Mars soil probe for use in breast cancer applications.

photos by Dominic Hart

TGIR attendees read information about award winners and other poster presentation materials.

More information about TGIR and award winners and nominees can be found at:

http://amesnews.arc.nasa.gov/astrogram/2002_astrograms/tgir/tgir.html

BY JONAS DINO

Study to put new 'spin' on how humans handle gravity

Four men will brave unknown, unfamiliar and unearthly conditions this summer. But they're not going into space, they're stepping inside Ames' 20-G centrifuge for a 22-hour ride at up to twice Earth's gravity.

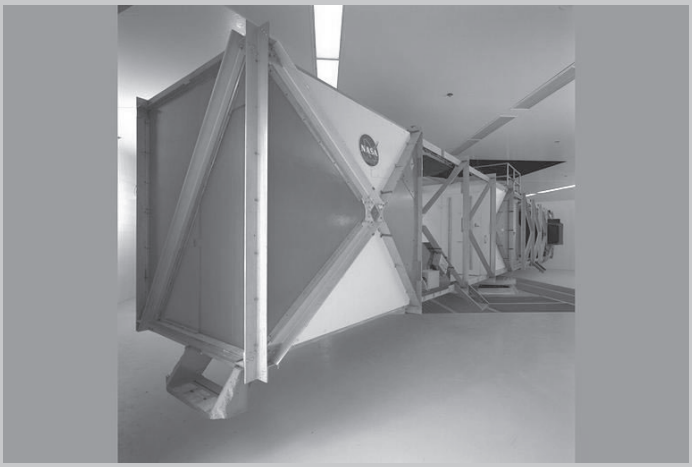


photo by JT Heineck

The Ames 20-G centrifuge will be used in the upcoming study about how humans adapt to hypergravity.

The men will participate in a first-of-its-kind study of how humans adapt to prolonged exposure to hypergravity, gravitational forces higher than Earth's normal gravity. Dr. Malcolm Cohen, chief of the Human Information Processing Research Branch, will head the study to begin in July.

"There is virtually no objective scientific data on the human body's response to prolonged hypergravity," Cohen said. "We want to find out if people can function normally in this type of environment and also if there are physiological changes that help people adapt to increased gravity."

When astronauts travel in space at 0G for extended periods, their bodies adapt to weightlessness. In one major change, an astronaut's heart does not work as hard to get blood to the brain since it's not pumping against gravity. Such adaptations produce negative effects upon return to 1G on Earth, such as fainting or dizziness.

"At NASA, we look at gravity as a continuum," Cohen said. "Can exposure to hypergravity give you opposite, positive effects? Are there advantages from prolonged exposure to high G?" One of the study's tests will look at whether the hearts of the men spinning in the centrifuge work harder to pump blood up to their brains against higher-than-normal gravity.

Each subject, a healthy male between the ages of 18 and 35 and under 5'8" tall, will spin 22-hour sessions at increasing G-forces over a nine-week period. Each session will start with a G-tolerance test, which measures the highest G-force limit each subject can withstand. A cab designed specifically for this test sits on one side of the 58-foot centrifuge arm, where the subject will sit in a swing-out chair. The centrifuge will pick up speed, increasing the gravitational force by 1G every 15 seconds.

"As the G-force increases, one of the first symptoms is called grayout, where vision dims and colors fade and you start to lose peripheral vision," said research scientist Abigail Bautista, a coordinator for the project. "The test gauges how much they can take before blackout occurs, although we never want to actually get to the point of blackout." The subject's safety is first priority; he can stop the test at any time.

During the spin, Ames' medical services officer Dr. Ralph Pelligra will keep tabs on the subject's heart rate and blood flow to the brain. A light ring around the subject's head keeps track of peripheral vision. Lights on both sides flash first out at the edge of the subject's field of view and then the flash moves in toward the center. While looking straight ahead, the subject presses a button to shut off the lights as soon as he can detect them. The centrifuge will automatically shut down if the subject does not respond before the lights reach the space within a narrow field of vision 40 degrees wide.

"It's the oddest thing. You get tunnel vision where everything goes dark but you are still conscious," recounts Arsenio Dimanlig, a research engineer in the Aeromechanics branch. He took the G-tolerance test during a preliminary phase of the project in the summer of 2000. "You have a harder time breathing and it feels like someone's pressing you down into your seat."

Like Dimanlig, the subjects will climb into the habitation cab on the other end of the centrifuge arm to spend 22 hours spinning at 1.25G, 1.5G, 1.75G, or 2G. The enclosed cab contains a cot, toilet, food, water, a television and a laptop computer. The researchers and centrifuge operators monitor the subjects by video. The subjects can eat, read, watch movies or play computer games.

"They will be encouraged to sit rather than lie down because they are not stressing their cardiovascular system if they are lying down," Cohen said. Every four hours, the subjects will be asked to spend three minutes lying down, three minutes sitting and three minutes standing up.

During these transitions, blood pressure in the head drops and the cardiovascular system has to adjust to get blood to the higher head positions. A biofeedback sensor vest worn by the subjects will monitor their vital signs, including blood pressure, circulation in the extremities, and blood flow to the head. The data will help researchers determine how quickly a subject adapts to cardiovascular stress imposed by gravity.

After the 22-hour spins, the G-tolerance test will be repeated. Cohen wants to know if spending many hours in hypergravity will increase a person's G-tolerance. The maximum G-force tolerated by any human is about 6G, but each individual's maximum tolerance varies. Astronauts experience hypergravity for brief periods during take-off and re-entry. Using a similar centrifuge, gravity might be simulated during long-term space travel or work on the space station.

"If we are looking at landing on Mars, there's a 5G re-entry profile that is at the limit for most people -- especially people deconditioned from traveling in 0G conditions," Cohen said. "Then the astronauts will have to deal with martian gravity. While it's only roughly a third of Earth's gravity, it's still gravity after months of weightlessness. We hope what we learn will help us better prepare for something like that."

By Kendall Powell

O'Keefe features

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the spirit of the Freedom to Manage initiative and in accordance with three fundamental principles espoused by Secretary of State Paul O'Neill. Those principles are that we assume everyone at NASA is a professional and treat them accordingly; we provide the resources required so that NASA employees can do their jobs; and we hold everyone accountable for their performance.

A focus of efforts this year in preparation for the FY04 budget submission, O'Keefe said, will be to determine "how do we allocate the resources we have to achieve mission objectives?" What emerges will become the "template for making program decisions" that provide "a fighting chance to carry out mission objectives." O'Keefe stressed that NASA must be "selective, targeted and focused."

With respect to decision-making models, he observed that NASA will employ a variety of centralized, decentralized and hybrid approaches. He said that we must consider carefully "what 'lead center' means," and while "program management may be at the centers, authority and oversight may come from somewhere else entirely."

In closing, O'Keefe reiterated in response to a question that the integrated financial management planning activity is "the highest initiative that we have to implement." We must -- and will -- do so in a "seamless" manner by the Sept. 30, 2002 target, he added.

Further information about the Freedom to Manage initiative can be found on the Web at: http://f2m.nasa.gov/

by David Morse

Tropical runaway greenhouse provides insight to Venus

A region in the western tropical Pacific Ocean may help scientists understand how Venus lost all of its water and became a 900-degree inferno. The NASA study also should help researchers understand what conditions on Earth might lead to a similar fate here.

The phenomenon, called the 'runaway greenhouse' effect, occurs when a planet absorbs more energy from the sun than it can radiate back to space. Under these circumstances, the hotter the surface temperature gets, the faster it warms up. Scientists detect the signature of a runaway greenhouse when planetary heat loss begins to drop as surface temperature rises. Only one area on Earth -- the western Pacific 'warm pool' just northeast of Australia -- exhibits this signature. Because the warm pool covers only a small fraction of the Earth's surface, the Earth as a whole never actually 'runs away.' However, scientists believe Venus did experience a global runaway greenhouse effect about 3 billion to 4 billion years ago.

"Soon after the planets were formed 4.5 billion years ago, Earth, Venus and Mars probably all had water. How did Earth manage to hold onto all of its water, while Venus apparently lost all of its water?" asks Maura Rabbette, Earth and planetary scientist in Code SGP. "We have extensive earth science data to help address that question."

Rabbette and her co-investigators from NASA Ames, Christopher McKay, Peter Pilewskie and Richard Young, used atmospheric conditions above the Pacific Ocean, including data recorded by NASA's Earth observing system of satellites, to create a computer model of the runaway greenhouse effect. They determined that water vapor high in the atmosphere produced the local signature of a runaway greenhouse.

At sea surface temperatures above 80 F (27 C), evaporation loads the atmosphere with a critical amount of water vapor, one of the most efficient greenhouse gases. Water vapor allows solar radiation from the sun to pass through, but it absorbs a large portion of the infrared radiation coming from the Earth. If enough water vapor enters the troposphere, the weather layer of the atmosphere, it will trap thermal energy coming from the Earth, increasing the sea surface temperature even further.

The effect should result in a chain reaction loop where sea surface temperature increases, leading to increased atmospheric water vapor and more trapped thermal energy. This causes the temperature increase to 'run away,' causing more and more water loss through evaporation from the ocean. On Earth, sea surface temperatures never reach more than about 87 F (30.5 C), so the runaway phenomenon does not occur.

"It's very intriguing. What is limiting this effect over the warm pool of the Pacific?" asked Young, a planetary scientist. He suggests that cloud cover may affect how much energy reaches or escapes Earth, or that the ocean and atmosphere may transport trapped energy away from the local hotspot. "If we can model the outgoing energy flux, then maybe we can begin to understand what limits sea surface temperature on Earth," he said. The Ames researchers are not the first to study the phenomenon. No consensus has been reached on the energy turnover or the limitation of sea surface temperature.

Rabbette analyzed clear-sky data above the tropical Pacific from March 2000 to July 2001. She determined that water vapor above 5 kilometers (3 miles) altitude in the atmosphere contributes significantly to the runaway greenhouse signature. She found that, at 9 kilometers (5.6 miles) above the Pacific warm pool, the relative humidity in the atmosphere can be greater than 70 percent -- more than three times the normal range. In nearby regions of the Pacific where the sea surface temperature is just a few degrees cooler, the atmospheric relative humidity is only 20 percent. These drier regions of the neighboring atmosphere may contribute to stabilizing the local runaway greenhouse effect, Rabbette said.

The Ames team uses real climate information such as relative humidity and temperature -- not hypothetical numbers -- in the moderate resolution atmospheric radiative transfer, or MODTRAN, modeling program. The program calculates how much energy escapes back to space from the top of Earth's atmosphere. The researchers plan to experiment with the model to test the runaway greenhouse signature's sensitivity to climate conditions. By varying the abundance of other greenhouse gases, such as carbon dioxide and by adding clouds in the model, they will see the overall effect on the outgoing energy.

The model may help researchers uncover why Venus experienced a complete runaway greenhouse and lost its water over a period of several hundred million to a billion years. The research may also help determine which planets in the so-called 'habitable zone' of a solar system might lack water, an essential ingredient for life as we know it.

BY KENDALL POWELL

Abundant water ice found on Mars

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organisms that live on ice, but where there is ice today could once have been liquid. We may be seeing the 'tip of the iceberg,' with liquid water still somewhere below the surface."

The gamma ray spectrometer senses the composition below the surface to a depth as great as three feet. By combining the different types of data from the instrument, the team has concluded that hydrogen is not distributed uniformly over the upper three feet, but is more concentrated in a lower layer beneath the top-most surface.

The team also found that the hydrogen-rich regions are located in very cold areas where ice should be stable. This relationship led the team to conclude that the hydrogen is, in fact, in the form of ice. The ice-rich layer is about two feet beneath the surface at 60 degrees south latitude, and within one foot of the surface at 75 degrees south latitude.

"Mars has surprised us again. The early results from the gamma ray spectrometer team are better than we ever expected," said Stephen Saunders, Odyssey project scientist at NASA's Jet Propulsion Lab. "In a few months, as we get into martian summer in the northern hemisphere, it will be exciting to see what lies beneath the cover of carbon dioxide dry-ice as it disappears."

"The signature of buried hydrogen seen in the south polar area is also seen in the north, but not in the areas close to the pole. This is because the seasonal carbon dioxide frost covers the polar areas in winter," said William Feldman, principal investigator for the neutron spectrometer at Los Alamos National Lab. "As northern spring approaches, the latest neutron data indicate that the frost is receding, revealing hydrogen-rich soil below."

"We have suspected for some time that Mars once had large amounts of water near the surface. The big questions we are trying to answer are, 'where did all that water go?' and 'what are the implications for life?' Measuring and mapping the icy soils in the polar regions of Mars is an important piece of this puzzle. But we need to continue searching, perhaps much deeper underground, for what happened to the rest of the water we think Mars once had," said Jim Garvin, Mars program scientist at NASA headquarters.

Another new result from the neutron data is that large areas of Mars at low to middle latitudes contain slightly enhanced amounts of hydrogen, equivalent to several percent water by mass. Interpretation of this finding is ongoing, but the team's preliminary hypothesis is that this relatively small amount of hydrogen is more likely to be chemically bound to the minerals in the soil, than to be in the form of water ice.

"We have been waiting more than 20 years to fly a detector of this sort around Mars," noted Hubbard. "I was a scientist at Lawrence Berkeley Lab as we developed the fundamental technology for Boynton's sensor. It is very satisfying to see the goal finally reached."

JPL manages the 2001 Mars Odyssey mission for NASA's Office of Space Science. Investigators at Arizona State University, Tempe; the University of Arizona, Tucson; and NASA's Johnson Space Center, Houston, operate the science instruments. The University of Arizona provided the gamma ray spectrometer in collaboration with the Russian Aviation and Space Agency, which provided the high-energy neutron detector, and the Los Alamos National Lab., New Mexico, which provided the neutron spectrometer. Lockheed Martin Astronautics, Denver, developed and built the orbiter. Mission operations are conducted jointly from Lockheed Martin and from JPL.

2001 Mars Odyssey launched on April 7, 2001, and arrived at Mars on Oct. 23, 2001. Additional information about Mars Odyssey and the gamma ray spectrometer is available on the Internet at: http://mars.jpl.nasa.gov/odyssey/ and at: http://grs.lpl.arizona.edu

BY ANN HUTCHISON

Ames hosts law enforcement training academy

NASA Ames recently hosted the NASA Federal Law Enforcement Training Academy (NFLETA), including instructors from the Kennedy Space Center, where the program is administered.

photo by Tom Trower

Security Officer Greg James (front left) receives the Distinguished Graduate Award from Protective Services Office Chief Clint Herbert (right) in March.

Designed to train new protective service law enforcement and security officers, the four-week course of instruction covered such diverse topics as constitutional law, United States criminal code, NASA regulations, federal arrest authority, use of force, defensive tactics and community relations. All NASA Ames protective service personnel received annual first responder training in HAZMAT, first aid/CPR, weapons qualifications and emergency vehicle operations.

The class graduated 13 new protective service personnel, 12 assigned to Ames and one assigned to the Stennis Space Center. Ames security officer Greg James was awarded the honor graduate certificate for having the highest combined score for academic and physical achievement. Protective Services chief Clint Herbert administered the oath of office to all of the new officers at the graduation ceremony on March 27.

The Ames security officers entered a two-week, on-the-job training program concentrating on entry control, badge control, facility security and other physical security areas. The law enforcement officers entered a 10-week, field-training program during which time they will be trained and evaluated by field training officers on their abilities to handle emergency situations, patrol duties, traffic control and other duties they are called upon to handle on a daily basis.

The final result is a qualified, well-trained and dedicated officer, equipped to handle any contingencies so as to ensure the safety and protection of all personnel and facilities at NASA Ames.

BY LT. MARK TARTE

Safety and Quality week events draw crowds

photos by Tom Trower

Many at Ames participated in the Safety Week fun run held on May 21. The Safety Street Fair held on May 23 included various safety and health vendor booths, providing information such as ergonomic training, water conservation, asbestos containment, fitness information and many others. Music was provided, as well as cake and punch, for attendees.

NAI members elected into National Academy of Sciences

The NASA Astrobiology Institute extends congratulations to two new members of the National Academy of Sciences (NAS). Dr. John P. Grotzinger of the NAI Harvard lead team and Dr. Gerald Schubert of the NAI University of California Los Angeles lead team join 13 other NAI researchers as members of the National Academy of Sciences. Only 72 new members of the NAS were selected this year. Election to membership in the academy is one of the highest honors that can be accorded a U.S. scientist or engineer. Those elected this year bring the total number of active NAS members to 1,907.

Grotzinger, Schrock professor of earth sciences and director of the Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, is senior project investigator for 'The Planetary Context of Biological Evolution: Neoproterozoic-Cambrian Environment Change and Evolution.' He is developing digital mapping techniques that will be applicable to studies of martian geology. Grotzinger also examines subsurface cores in Oman for paleontologic information about Cambrian ecosystem expansion.

Schubert, professor and department chair of geophysics and planetary sciences, University ofCalifornia, Los Angeles, addresses the physics of the Earth and the planets, their structures and evolution. He has conducted research on fundamental geophysical fluid dynamics, structure of planetary interiors, mantle convection in the Earth and planets, plate tectonics, chemistry of upper atmospheres, and planetary atmospheres, surfaces and interiors. He is co-author of the books Geodynamics and Mantle Convection in the Earth and Planets.

It is estimated that approximately 150 members of the NAI would be eligible for election in the NAS. A previous calculation found 13 existing members of the NAI who are also in the National Academy of Sciences. Previously admitted NAI members of the NAS include:

Dr. John Abelson, NAI Jet Propulsion Laboratory. 1 lead team; Dr. Thomas Ahrens, NAI Jet Propulsion Laboratory, 1 lead team; Dr. Baruch Blumberg, NAI director; Dr. John Hayes, NAI Harvard University, lead team; Dr. Paul Hoffman, NAI Harvard University, lead team; Dr. Heinrich Holland, NAI Harvard University, lead team; Dr. Andrew Knoll, NAI Harvard University, lead team; Dr. Norman Pace, NAI University of Colorado, Boulder, lead team; Dr. Julius Rebek, NAI Scripps Research Institute, lead team; Dr. J. William Schopf, NAI University of California, Los Angeles, lead team; Dr. Melvin Simon, NAI Jet Propulsion Laboratory, 1 lead team; Dr. George Wetherill, NAI Carnegie Institution of Washington, lead team; Dr. Hatten Yoder, NAI Carnegie Institution of Washington, lead team.

In addition to the NAI lead team members, eight members of the NAI Director's Science Council also have been elected into the NAS. They include: Dr. Sidney Altman, Yale University; Dr. Walter Alvarez, University of California, Berkeley; Dr. Philip W. Anderson, Princeton University; Dr. Sydney Brenner, Molecular Sciences Institute; Dr. Murray Gell-Mann, Santa Fe Insitute ; Dr. Robert Laughlin, Standord University; Dr. Joshua Lederberg, The Rockerfeller University; and Dr. Maxine F. Singer, Carnegie Institution of Washington

The National Academy of Sciences was established in 1863 by an act of Congress, signed by Abraham Lincoln. The academy is a private organization of scientists and engineers 'dedicated to the furtherance of science and its use for the general welfare.'

For more information about the National Academy of Sciences, visit http://www.nationalacademies.org/

Code JPFB wins EPA award

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ings and significantly reduced potential exposures to workers applying these products and other employees, as well as exposure reduction to resident animal populations who might otherwise come into contact with such materials.

All debris generated by landscaping and grounds maintenance operation, plus a limited amount of shredded paper, are collected and composted onsite. The operation produces all the compost used at Ames. Compost is used in landscaping operations and is also used to enhance bioremediation of fuel-contaminated soil generated from storage tank removal projects.

Each year, the EPA celebrates and recognizes outstanding environmental advocates who have made significant contributions toward enhancing and protecting the quality of our environment. Representatives from Code JFP, Johnson Controls, Inc., Shimada Landscape, A-Pro Pest Control and South Bay Maintenance received their award at the EPA office in San Francisco on June 6.

For more information, contact Al Lyon at ext. 4-3319.

Upgraded calendar service is here

The Applied Technology Division, Code JT, is proud to present the upgraded Ames calendar service. The old Netscape calendar service was phased out and the new and fully supported Ames calendar service was activated on April 29. This upgrade replaced a service that was operating at its maximum capacity with one that can easily accommodate the projected usage at Ames. Before the upgrade, new accounts could not be added and calendar support was limited. Now, the new service is fully operational and ready to handle new calendar accounts.

To prepare Ames residents for the calendar service upgrade, the Applied Technology Division set up a series of town hall meetings. The audience included key IT personnel and users of the old calendar service. Pertinent issues such as desktop software requirements for the new service, account registration, benefits, schedule, and contact information were addressed. Wei Lin, the project lead, and the calendar service project team were present at the meetings to address concerns, issues and answer questions from users.

For quality control purposes, it was decided that no new calendar accounts would be added until the new calendar service was deemed stable and performing as expected.

Effective June 3, after a month of carefully monitoring the performance of the new calendar service, the Applied Technology Division is now ready to accept new accounts. You may register for your new calendar account at: http://amescalendar.arc.nasa.gov. A signed registration form must be submitted before a calendar account can be processed.

For more information about the Ames calendar service, log on to: http://amescalendar.arc.nasa.gov. Here you'll find new user information, quick reference guides, support and contact numbers, policy and even access your calendar via the Web!

June IT events:

- 6/12: EPR and Section 508 Town Hall meeting N245 auditorium, 10:00 a.m.
  -- People who buy electronic and information technology
- 6/19: AppleTalk phase out briefing N269 Rm 100, 1:15 p.m.
  -- MAC support personnel
- 6/20: HVAC Town Hall meeting N233, Rm 172, 10:30 a.m.
  -- N233 residents
- 6/27: Web and Section 508 outreach N245 auditorium, 10:30 a.m.
  -- Web developers

Ames celebrates VPP Star status

On May 23, the Occupational Safety and Health Administration (OSHA) recognized NASA Ames for its excellence in health and safety programs.

photo by Tom Trower

From left to right: Holding the VPP Star flag, Nancy Bingham, Ames Deputy Director (Acting); Gabriel Gillotti, director of OSHA's Region IX Voluntary Protection Program (VPP); and Marc M. Cohen, president Ames Federal Employees Union. The flag was presented to Ames on May 23 in recognition of the center's excellence in its health and safety programs.

Gabriel Gillotti, director of OSHA's Region IX Voluntary Protection Program (VPP) presented the VPP Star flag to Nancy Bingham, NASA Ames Deputy Director (Acting) at a commemorative ceremony held during the center's annual safety and quality week. Gillotti complimented the center on the outstanding cooperation he has seen from the union, management and employees as a team working together as partners with OSHA.

The Star certification represents OSHA's most prestigious award. Ames became the first federal facility in the western region to earn Star status, which includes the states of California, Arizona and Nevada. Ames is the third NASA site in the country to achieve the Star level.

As a VPP Star site, Ames is recognized as having an exemplary commitment to workplace health and safety. For over two years managers, union members and employees have worked together to achieve this symbol of excellence. Suzanne Meyer, vice president of the Ames Federal Employee Union, said "certification means the relationship between union, management and employees is working. It is a model of success."

Bingham observed that today is not the end of the process, but the culmination of our efforts. We must continue to show improvement, defending and maintaining what we have and achieving ever-greater excellence in our safety and health programs, in our facilities and in our commitment.

The Star ceremony concluded at the flag pole in front of Building 200 where the combined management, union and employee team together raised the VPP Star flag.

Bingham remarked, "each one of you -- our entire workforce -- are the beneficiaries of what we have jointly accomplished. You are also the instrument and the means to our success. I thank each and every one, and encourage you to take responsibility, be the standard bearer and continue to build momentum for our safety and health priorities and programs."

BY SHELLEEN LOMAS

Growing the next generation of computers

Advancing the triumvirate of nano-, bio- and information technology, research within the NASA Advanced Supercomputing division has attracted recognition with the award of a Director's Discretionary Fund grant to researchers Deepak Srivastava and Chris Henze. Their proposal for the 'biomimetic simulation of signal transmission in nanotube-based dendritic networks' represents an innovative step forward in the division's work on nanotechnology. Inspired by the structure and operations of biological neural systems, the scientists plan to investigate the properties of a 3-D, tree-like architecture of carbon nanotubes and prove its viability.

The field of molecular electronics using carbon nanotubes has progressed rapidly in recent years resulting in several newly patented technologies, which experts believe will ultimately lead to the next generation of electronic computing devices. The National Science Foundation estimates that by the year 2015, the market for products manufactured using nanotechnology will reach $1 trillion. In his latest budget proposal, President Bush included a 17 percent increase in spending on nanotechnology research.

NAS division's proposal of a 3-D, tree-like circuitry takes a unique approach to current research by private industry and academia, which has so far focused on 2-D models. "We recently showed that three-terminal nanotubes grown as a y-junction serve as rectifier switches and have analog logic capacity," said Srivastava, senior scientist and lead of computational nanotechnology investigations at NAS. "These properties inspired us to consider the concept of a system architecture similar to the biological neural system, but made up of synthetic material."

By taking data derived from stimulating the nerve cells of crickets, Henze, a senior research scientist, is able to simulate their electronic behavior. Such simulations are a major tool in determining exactly how signals are transformed as they pass through the branch structures of neurons. "What's becoming clear is that there's a lot of nonlinear processing going on in the complex branching structures," said Henze, "and it has a lot to do with the geometry of the branching." This observation, combined with Srivastava's simulations in building branched nanotube systems, led to a confluence of ideas for the proposal that the scientists hope will ultimately demonstrate how signals could be transmitted and processed as they pass through a branched-tree system made of carbon nanotubes.

The Director's Discretionary Fund provides seed money for innovative and high-risk research that, if successful, could lead to fundamental scientific breakthroughs. The NAS scientists hope that showing a high level of functionality will inspire other groups to try to grow the tree and eventually lead to very complex sensing and computing applications.

BY JULIE A. JERVIS

Integrated financial management moves forward

Implementing successful centerwide change requires the commitment, support and teamwork of people at all levels. Understanding this need for collaboration, the Ames Integrated Financial Management Program (IFMP) has created an infrastructure to provide leadership, direction and resources to ensure program success. The IFMP team consists of a steering committee, process owners, project module teams and an implementation support team (IST).

IFMP is following a modular implementation strategy that cascades the 'go live' dates of projects. This cascading strategy allows the IFMP team to pay attention to balancing the human side of change as well as the requirements associated with a large-scale enterprise resources system implementation.

Centerwide implementation of the project modules requires the ability to identify and make the necessary changes in processes and working relationships. The most effective and enduring way to make these changes is through the direct involvement and commitment of people within the processes. That is why there is such broad participation in each of the module projects.

Each group within the IFMP infrastructure has roles and responsibilities that help guide and coordinate this work. The Ames IFMP steering committee is responsible for the overall coordination of the program, providing resources, removing barriers, empowering action, resolving any center-level conflicts and serving as a sounding board for project team issues. At the strategic level, this primary role is to develop a vision, a 'concept of operations' of how Ames will do business in the new IFMP environment. The IFMP vision at Ames is to empower staff to make strategically sound business decisions.

Project module teams are the 'engines' of IFMP implementation because they work across a range of functional, change management, and IT roles to drive the process. Project team members are chosen from the functional area(s) affected by the module being implemented. The project team is responsible for planning and implementing the project. Teams work with their functional leaders, called process owners, to analyze issues, solicit support and resources, make decisions about changes and implement the project in an effective and timely manner. The implementation support team reports to the steering committee, and it provides services to its customers, the project teams, and the team's stakeholders or people who are impacted by the change.

The steering committee and an implementation support team provide important on-going support for IFMP, including:

- An enduring 'implementation machine' that ensures that the implementation of each and every project fits into the overall vision and business strategy;
- Lessons learned from each project, which are then applied to future implementation at the center;
- Build the capacity for process improvement and sustained organizational change throughout the center. Developing an experienced core of change managers and agents who can help future change efforts.

The key roles of the IST are:

- Actively pursue opportunities for knowledge transfer between centers;
- Assess the center's change readiness;
- Identify barriers to IFMP-related change;
- Navigate and minimize organizational barriers to change;
- Implement process changes at Ames;
- Customize program and lead center change management approaches;
- Identify and close skills gaps through training and other learning activities;
- Provide regular status updates to lead center and program office;
- Provide specific feedback to the program office.

The IST team has articulated guiding principles to help this accomplish its work and realize this vision. Their guiding principle statement reads:

In all that we do we want to ensure a focus on improving processes and enhancing the quality of work life for all employees. For information about IFMP and the IFMP team, contact any IST member:

- Greg Josselyn, IST Lead, gjosselyn@mail.arc.nasa.gov
- Gail James, Training gjames@mail.arc.nasa.gov
- Linda Jensen, Transition Management ljensen@mail.arc.nasa.gov
- Ely Cooper, Change Management ecooper@mail.arc.nasa.gov
- Pam McGee, Communication pmcgee@mail.arc.nasa.gov
- William Likens, IT wlikens@mail.arc.nasa.gov

Ames modifies PR processes

Do you know what 'electronic and information technology (EIT) accessibility' or its commonly used nickname Section 508 is about? Do you know that Ames' implementation will impact how purchase requests (PRs) will be processed in the future?

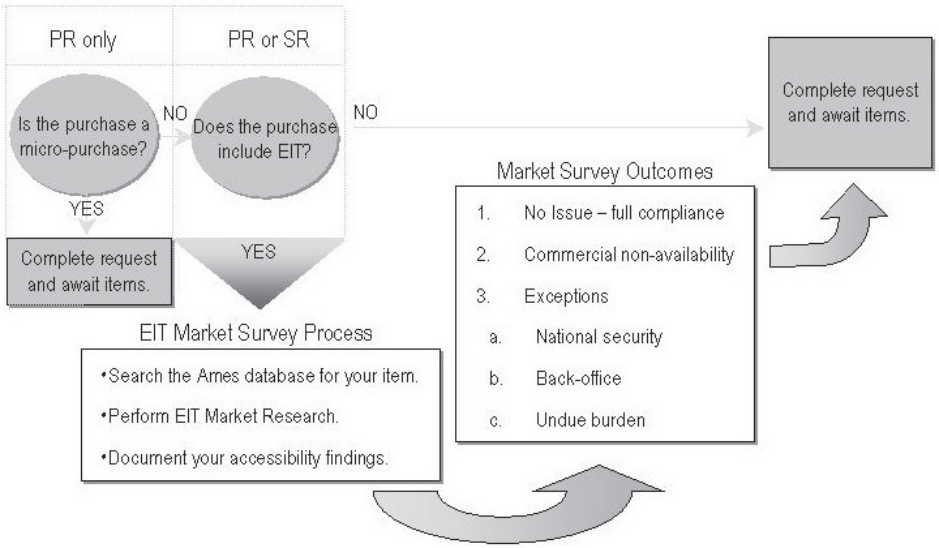
With the exception of micro-purchases (under $2,500), all PRs that include the purchase of EIT will require a market survey and certification. The new process is illustrated in the above flow chart.

To learn more about the process, and how it will impact PR initiators, Code J is sponsoring a town hall meeting on Wednesday, June 12 from 10:00 a.m. to 11:30 a.m. in the N245 auditorium. All Ames personnel who are impacted by this change in process are encouraged to attend. The roll-out schedule is set forth below.

All PRs (ePR, paper-based) will begin the compliance process on June 20. As of that date, the acquisition cision will no longer accept PRs that do not include the Section 508 certification.

Service requests to SERV I will begin the compliance process on Oct. 1. Again, as of that date SERV I will not accept SRs that do not include the Section 508 certification.

Code JT maintains a Web site, located at: http://section508.arc.nasa.gov/ that provides additional information and assistance for Ames personnel to comply with the new law.



Event Calendar

Ames Amateur Radio Club, third Thursday of each month, 12 noon, N-T28 (across from N-255). POC: Michael Wright, KG6BFK, at ext. 4-6262. URL: http://hamradio.arc.nasa.gov.

Ames Ballroom Dance Club. Classes meet Tuesdays. Begin classes start at 6:15 p.m. Higher-level class meets at 5:15 p.m. Held in Bldg. 944, the Rec. Center. POC: Helen Hwang, hwang@dm1.arc.nasa.gov.

Ames Bowling League, Palo Alto Bowl on Tuesday nights. Seeking full-time bowlers and substitutes. Pre-league meeting at Palo Alto Bowl on Tues, August 28 at 6 p.m. Questions to sign up: Mike Liu at ext. 4-1132.

Ames Child Care Center Board of Directors Mtg, every other Thursday (check web site for meeting dates: http://accc.arc.nasa.gov), 12 noon to 2 p.m., N-269, Rm. 201. POC: Joan Walton, ext 4-2005.

Ames Contractor Council Mtg, first Weds ea. mon, 11 a.m., N-200, Comm. Rm. POC: Paul Chaplin, ext. 4-3262.

Ames Diabetics (AAD), 1st & 3rd Weds, 12 noon to 1 p.m., at Ames Mega Bites, Sun rm. Support group discusses news affecting diabetics. POC: Bob Mohlenhoff, ext. 4-2523/email at: bmohlenhoff@mail.arc.nasa.gov.

Ames Federal Employees Union (AFEU) Mtg, third Wednesday of each month, 12 p.m. to 1 p.m., Bldg. 19, Rm 1042. Info at: http://www.afeu.org. POC: Marianne Mosher at ext. 4-4055.

Ames IT Security, Birds-Of-A-Feather Mtg, June 13, 10 a.m. to 11a.m., Bldg. 245/272 auditorium, Topic: Wireless Technology at Ames. Open to all IT professionals interested in learning about Wireless LANS. Presenters: Thom Stone and Mark Radwin. POC: Bob Lopez, ext. 4-0097/ blopez@mail.arc.nasa.gov

Ames Sailing Club Mtg, second Thursday of each month, 11.30 a.m. -1 p.m. POC: Diane Purcell ext.4-3232. Check Web site for monthly calender of events, http://sail.arc.nasa.gov

Environmental, Health and Safety Information Forum, first Thursday of each month, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. URL: http://q.arc.nasa.gov/qe/events/EHSseries/ POC: Julie Quanz at ext. 4-6810.

Jetstream Toastmasters, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Cathy Payne at ext. 4-0003.

Model HO/HOn3 Railroad Train Club at Moffett Field, Bldg. 126, across from south end of Hangar One. Work nights: usually Friday nights, 7:30 p.m. to 9:30 p.m. Play time: Sundays, 2 p.m. - 4 p.m. John Donovan (408) 735-4954 (W) or (408) 281-2899 (H).

Nat'l Association of Retired Federal Employees, (NARFE), first Friday of each month, S. J. Chptr #50 mtg, 9:30 a.m., July 5 mtg., 51st anniversary luncheon, Three Flames Restaurant, 1547 Meridian Avenue., 11 a.m., $16 pp. POC: Earl Keener (408) 241-4459 or NARFE 1-800-627-3394.

Native American Advisory Committee Mtg, fourth Tues each month, 12 noon to 1 p.m., Bldg. 19, Rm 1096. POC: Mike Liu at ext. 4-1132.

Ames Classifieds

Ads for the next issue should be sent to *astrogram@mail.arc.nasa.gov* by the first Friday following publication of the present issue and must be resubmitted for each issue. Ads must involve personal needs or items; (no commercial/third-party ads) and will run on a space-available basis only. First-time ads are given priority. Ads must include home phone numbers; Ames extensions and email addresses will be accepted for carpool and lost and found ads only. Due to the volume of material received, we are unable to verify the accuracy of the statements made in the ads.

Housing

Duplex 1bd/ba and gar. in Mt.View, 5 min. to Ames. Rent $1,050 plus dep. Pet OK. Long (650) 962-8728.

For rent: single-story home, IBM area, S. San José, 3bd/2ba, 2 car garage, fireplace, D/W, freshly painted outside $1,650/mo, plus dep. Call (408) 365-7265.

Room in 2bd/1ba apartment in Sunnyvale. $505/mo. plus deposit. Female preferred NS/NP. Avail July, located 10-15 min. from Ames. Estela (408) 738-1718.

Palo Alto condo for rent. 2bd/1ba, new windows/paint/carpets/blinds, AEK, appliances, pool, $1,550/mo. Call (650) 493-1079.

Room in 3bd/2ba MV townhouse, close to downtown. $800 rent (incl. utilities). Share with professional female. Private bathroom. Complex has tennis courts, pool and hot tub. Female preferred. N/S. Call (650) 254-1121.

Large room to rent in spacious home w/two other busy professionals, short commute. $600. Available immediately. W/D, utils included (except phone). Peaceful/low stress environment. John (408) 567-0365 or email at: John.Stephenson@jdsu.com

Room for rent w/private bath, W/D, yard, quiet area/housemate in Fremont. $570 plus utils and dep. Carpool some days possible. No: smokers, slobs, allergies to cats. Avail. mid-June. Call (510) 797-7442.

Apartment for rent: 1bd/1ba, Sunnyvale- Fair Oaks/101. Quiet/clean/large. Free laundry. $925/mo, $900 dep. Call (408) 988-0880.

Miscellaneous

Bunkbed, student desk, and chest of drawers. Knotty pine. $500. Linda (408) 262-6136.

Wanted: Olympus OM-1n or OM-2n camera body in good working order for astrophotography. Zuiko lenses also wanted if avail. Give your unused equipment a good home! Brian at brian@landsurfing.com or (650) 940-1673.

Electric train board. Sturdy wood structure, slides under twin bed for easy storage. $90. Linda (408) 262-6136.

Student piano. Hobart M. Cable upright. good condition. $500. Linda (408) 262-6136.

Kenmore washer/dryer stack unit, two years service guarantee. Eight months old. Pd $997; sell for $500. Call Philip or Rafael (408) 295-5684 (H); (408) 655-9692 (cell).

Hamilton portable record turntable, model 935, integrated circuit, 4 speed, 78, 45, 33, 16. $50. Works fine. Email for photos. falcon7777@earthlink.net

Ames Retirements

Name	Code	Date
David H. Denbow	AF	5-31-02

Baby clothes and items; lots of infant-12 mth boy clothes, swing, bouncie, walker and other items. All in excellent condition. Call (408) 365-7575.

Sailboat 1/4 partnership. 25' Pacific Seacraft in Fort Mason marina (San Francisco). 4K or B/O. Email silvanopc@yahoo.com or call (415) 826-3041.

Toshiba microwave oven, 24.5 in. wide, good condition, $45. Call (650) 369-0578.

6 cylinder motor for a 1965 Mustang. Good condition, $225. Call (510) 657-4247.

Wicker chaise lounger chair. $55. Tan w/grey edges. 4.5 feet long. Email for photos: falcon7777@earthlink.net

Wanted: ping-pong table in good condition. Deanna (408) 260-1180.

Yarn wanted, any kind and color. My mom crochets lap robes for Veterans Hospital and hospice patients. Any amounts greatly appreciated. Linda (408) 739-7066.

Large plastic dog kennel w/grated door and windows. Holds up to 50 pd dog. Hardly used. $40. Call (510) 490-6505.

Pair of 49er tickets. Pre-season: Kansas City, Aug. 10, $84/pair; San Diego, Aug. 28, $84/pair. Call (650) 583-3046.

Transportation

Mini motor-home, self-contained. 104K mls on '87 Ford Econoline engine. $9,500 or B/O. Email silvanopc@yahoo.com or call (415) 826-3041.

'94 Plymouth Voyager, V6 3.0L, AC, AT, roof rack, 72k mls, great cond. $3,800. Call (650) 948-6310 eves.

'94 Geo Prism, well maintained by one owner, 94 miles, $3,200. Automatic, airbags, new timing belt, air conditioning. Call (650) 964-0496.

'96 Ford Windstar, GL model, dark green, all power, excellent condition, 124k mls, one owner. $7K. Call (408) 847-9106 after 6:30 p.m.

'98 Acura Legend, white, 146K mls, 5-spd manual, pwr windows, moon roof, sound mechanical condition, runs smoothly, $2,200 or B/O. Call (408) 773-8078.

'00 Lexus RX300 SUV. 17K mls, AC, stereo, CD, sun roof, and many more. Call (408) 446-4416.

Lost and Found

Found: Leather cap, hand made(?), dated 1978. Call Doug Pearson, ext. 4-6854.

Van Pool

Need riders for van pool from Los Banos to Ames and return. Arrive Ames 6:00 a.m. leave 3:30 p.m. Save your car. For more details call ext. 4-6793.

Ames Public Radio & Phone

1700 KHz AM radio -- information announcements and emergency instructions, when appropriate, for Ames employees. The emergency information phone number for Ames is (650) 604-9999.

Exchange Information

Information about products, services and opportunities provided to the employee and contractor community by the Ames Exchange Council. Visit the web site at: http://exchange.arc.nasa.gov

Beyond Galileo N-235 (8 a.m. to 2 p.m.) ext. 4-6873

Ask about NASA customized gifts for special occasions. Make your reservations for Chase Park.

Mega Bites N-235 (6 a.m. to 2 p.m.) ext. 4-5969

See daily menu at: http://exchange.arc.nasa.gov

Visitor Center Gift Shop N-223 (10 a.m. to 4:00 p.m.) ext. 4-5412

NASA logo merchandise, souvenirs, toys, gifts and educational items.

Tickets, etc...(N-235, 8 a.m. to 2 p.m.) ext. 4-6873

Check Web site for discounts to local attractions, http://exchange.arc.nasa.gov and click on tickets. Jul 20 Champions on Ice; Aug 17 Circus (Oakland)

NASA Lodge (N-19) 603-7100

Open 7 days a week, 7:00 a.m. to 10 p.m. Rates from $40 - $50.

Vacation Opportunities

Lake Tahoe-Squaw Valley Townhse, 3bd/2ba, Balcony view, horseback riding, hiking, biking, golf, river rafting, tennis, ice skating, and more. Equipped. Summer rates. Call (650) 968-4155, DBMcKellar@aol.com

South Lake Tahoe Cottage w/wood fireplace and hot tub. Rates from $50 to $130 per night. Call (650) 967-7659 or (650) 704-7732.

Vacation rental, Bass Lake CA 14 mls south of Yosemite. 3bd/1.5 ba, TV, VCR, MW, frplc, BBQ, priv. boat dock. Sleeps 8. $1,050/wk. Call (559) 642-3600 or (650) 390-9668.

Big Sur vacation rental, secluded 4bd/2ba house in lovely canyon setting. Fully eqpd kitchen. Access to priv. beach. Tub in patio gdn. Halfway between Carmel & Big Sur. $175/night for 2; $225 for 4 and $250 for more, plus $150 cleaning dep. Call (650) 328-4427.

Incline Village: Forest Pines, Lake Tahoe condo, 3 bd/2 ba, sleeps 8. Fireplc, TV/VCR, MW, W/D, jacuzzi, sauna, pool. $120/night low season; $155/night high season. $90 cleaning fee and 12% Nevada room tax. Charlie (650) 366-1873.

Tahoe Donner vacation home, 2 bd/2ba. trees, deck, sun, fun. Access to pools, spa, golf, horseback riding, $280 wkend, $650 week. Call (408) 739-9134.

Ames hosts astrophysics workshop

NASA Ames hosted the NASA Laboratory Astrophysics Workshop at Moffett on May 1 - 3. This programmatic workshop is periodically held by NASA to assess the current state of knowledge in the interdisciplinary field of laboratory astrophysics, and the need to support current and future NASA space missions.

The workshop was sponsored by the Office of Space Science (OSS) at NASA headquarters and brought together a rich panel of experts in astrophysics, astronomy, physics, chemistry and planetary sciences, including top names in the field, and NASA program managers from headquarters and Ames.

The science event attracted 140 participants and featured invited oral presentations and poster sessions that sampled an exceptionally rich scope of science topics covering the spectrum of this multidisciplinary field. Topics ranged from high-energy astrophysics to the study of interstellar dust and solar system objects. The welcoming talk was delivered by Scott Hubbard, deputy director for research at Ames.

"This was an excellent and useful workshop. It resulted in an executive summary sent to headquarters and a white paper to be sent at the end of the month to support NASA's strategic planning on space science and astrophysics. The science program was organized by a national science organizing committee. The hard work of the local organizing committee, and in particular of Ames' Sara Acevedo and Dr. Jason Dworkin, resulted in a very enjoyable conference as we often heard from many participants," said Dr. Farid Salama, Code SSA, conference organizer and chair of the workshop's science organizing committee.

More information and all abstracts and proceedings can be found at: http://www.astrochem.org/nasalaw/

BY KATHLEEN BURTON

Astrogram deadlines

All Ames employees are invited to submit articles relating to Ames projects and activities for publication in the *Astrogram*. When submitting stories or ads for publication, submit your material, along with any questions, in MS word by e-mail to: astrogram@mail.arc.nasa.gov on or before the deadline.

Deadline:	*Publication:*
July 1	*July, 2002*
July 31	*Aug, 2002*

The Ames Astrogram

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The Ames Astrogram

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